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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-------------------------------------------------------------------------------------------------------|-------------|-------------------------|---------------------|------------------|
| 09/681,652 | 05/16/2001 | Catherine Mary Graichen | RD-27989 | 1015 |
| 6147 | 7590 | 09/23/2004 | EXAMINER | |
| GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 NISKAYUNA, NY 12309 | | | WILSON, YOLANDA L | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2113 | |

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|-----------------|-----------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/681,652 | GRAICHEN ET AL. |
| | Examiner | Art Unit |
| | Yolanda Wilson | 2113 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 20 August 2004.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-38 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1,2,4,6,9-12,20,23,24,28,29,32,34 and 38 is/are rejected.
 7) Claim(s) 3,5,7,8,13-19,21,22,25-27,30,31,33 and 35-37 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

Claim Objections

1. Claims 3,5,7-8,13-19,21-22,25-27,30-31,33,35-37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Harris et al. (USPN 20020091972A1). As appears in claim 1, Harris et al. discloses a data acquisition component that acquires service data for the plurality of components of at least one of the plurality of subsystems and determines age information and failure information from the service data for each of the plurality of components on page 2, paragraph 0023, “Operating data may consist of machine activity logs, error code logs, sensor logs and service history logs.” Harris et al. discloses a statistical analysis component that generates a statistical model according to the age information and failure information and a simulation component that predicts future failures for the life cycle of the plurality of components according to the statistical model on page 2,

paragraph 0012, "Predictive models are then created based on the analysis of the first set of historical operating data."

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2,6,9,10,11,12,20,23,24,28,29,32,34,38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris et al. (USPN 20020091972A1) in view of Eastman et al. (USPN 6226597B1).

6. As per claims 2,12,23, and 32, Harris et al. fails to explicitly state the statistical model comprises a Weibull distribution model.

Eastman et al. discloses this limitation in column 5, lines 40-43, "Having determined a minimum life for a component a Weibull distribution for the new part may be created by assuming the deterministic minimum predicted life represents a known occurrence probability."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the statistical model comprises a Weibull distribution model. A person of ordinary skill in the art would have been motivated to have the statistical model comprises a Weibull distribution model because the Weibull distribution model is a model that can show the lifetime of a component until it fails. Eastman et al. discloses in column 5, lines 27-30, "Rather, experience has shown that there is a

statistical distribution to fatigue failures and that this distribution can be described well using the Weibull cumulative probability function..."

7. As appears in claim 6, Harris et al. discloses a means for acquiring service data for the plurality of components of at least one of the plurality of subsystems and means for determining age information and failure information from the service data for each of the plurality of components on page 2, paragraph 0023, "Operating data may consist of machine activity logs, error code logs, sensor logs and service history logs." Harris et al. discloses means for generating a statistical model that approximates the failure information to the age information on page 2, paragraph 0012, "Predictive models are then created based on the analysis of the first set of historical operating data."

Harris et al. fails to explicitly state means for predicting future failures for the life cycle of the plurality of components according to the statistical model.

Eastman et al. discloses this limitation in column 4, lines 36-42, "The simulation is based on the probabilistic distributions of the fatigue indication occurrence and fatigue failure life from block 10..."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a means for predicting future failures for the life cycle of the plurality of components according to the statistical model. A person of ordinary skill in the art would have been motivated to have a means for predicting future failures for the life cycle of the plurality of components according to the statistical model because by detecting future failures of system components the operability of the system and its components can be maintained. Eastman et al. discloses in column 2, lines 47-50,

"maintaining fatigue critical components in a system that maintains or increases the level of reliability or safety of the system while reducing the operating cost of the system for the system users."

8. As per claim 9, Harris et al. discloses at least one data repository containing a plurality of service data for the plurality of subsystems and components, a predictive reliability system that predicts the reliability for the plurality of components of at least one of the plurality of subsystems according to the plurality of service data, the predictive reliability system comprising a data acquisition component that acquires the plurality of service data from the at least one data repository and determines age information and failure information from the service data for each of the plurality of components on page 2, paragraph 0023, "Operating data may consist of machine activity logs, error code logs, sensor logs and service history logs."

Harris et al. discloses a statistical model component that generates a statistical model according to the age information and the failure information on page 2, paragraph 0012, "Predictive models are then created based on the analysis of the first set of historical operating data." Harris et al. discloses a first computing unit configured to serve the at least one data repository and the predictive reliability system on page 3, paragraph 0028, "The data gathered for the DSE phase will in most cases comprise all of the operating data recorded by the machine's computer control system..."

Harris et al. fails to explicitly state a simulation component that predicts future failures for the life cycle of the plurality of components according to the statistical model.

Eastman et al. discloses this limitation in column 4, lines 36-42, "The simulation is based on the probabilistic distributions of the fatigue indication occurrence and fatigue failure life from block 10..."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a simulation component that predicts future failures for the life cycle of the plurality of components according to the statistical model. A person of ordinary skill in the art would have been motivated to have a simulation component that predicts future failures for the life cycle of the plurality of components according to the statistical model because by detecting future failures of system components the operability of the system and its components can be maintained. Eastman et al. discloses in column 2, lines 47-50, "maintaining fatigue critical components in a system that maintains or increases the level of reliability or safety of the system while reducing the operating cost of the system for the system users."

9. As per claim 10, Harris et al. discloses the at least one data repository stores historical failure data for the complex system on page 2, paragraph 0023, "Operating data may consist of machine activity logs, error code logs, sensor logs and service history logs."

10. As per claim 11, Harris et al. discloses the at least one data repository stores analysis data for the complex system including data for subsystems and components that form the complex system on page 2, paragraph 0023, "Operating data may consist of machine activity logs, error code logs, sensor logs and service history logs."

11. As per claims 20 and 29, Harris et al. discloses acquiring service data for the plurality of components of at least one of the plurality of subsystems and determining age information and failure information from the service data for each of the plurality of components on page 2, paragraph 0023, "Operating data may consist of machine activity logs, error code logs, sensor logs and service history logs." Harris et al. discloses generating a statistical model that approximates the failure information to the age information on page 2, paragraph 0012, "Predictive models are then created based on the analysis of the first set of historical operating data."

Harris et al. fails to explicitly state predicting future failures for the life cycle of the plurality of components according to the statistical model.

Eastman et al. discloses this limitation in column 4, lines 36-42, "The simulation is based on the probabilistic distributions of the fatigue indication occurrence and fatigue failure life from block 10..."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to predict future failures for the life cycle of the plurality of components according to the statistical model. A person of ordinary skill in the art would have been motivated to predict future failures for the life cycle of the plurality of components according to the statistical model because by detecting future failures of system components the operability of the system and its components can be maintained. Eastman et al. discloses in column 2, lines 47-50, "maintaining fatigue critical components in a system that maintains or increases the level of reliability or

safety of the system while reducing the operating cost of the system for the system users.”

12. As per claims 24 and 34, Harris et al. discloses prompting a user to select a plurality of component of at least one of the plurality of subsystems, in response to the user selection, acquiring service data for the selected plurality of components on page 2, paragraph 0013, “Operating data are collected from the targeted one or more machines or processes on an established schedule.” Harris et al. discloses determining age information and failure information from the service data for the selected plurality of components on page 2, paragraph 0023, “Operating data may consist of machine activity logs, error code logs, sensor logs and service history logs.” Harris et al. discloses generating a statistical model according to the age information and failure information on page 2, paragraph 0012, “Predictive models are then created based on the analysis of the first set of historical operating data.”

Harris et al. fails to explicitly state predicting future failures for the life cycle of the plurality of components according to the statistical model.

Eastman et al. discloses this limitation in column 4, lines 36-42, “The simulation is based on the probabilistic distributions of the fatigue indication occurrence and fatigue failure life from block 10...”

It would have been obvious to one of ordinary skill in the art at the time the invention was made to predict future failures for the life cycle of the plurality of components according to the statistical model. A person of ordinary skill in the art would have been motivated to predict future failures for the life cycle of the plurality of

components according to the statistical model because by detecting future failures of system components the operability of the system and its components can be maintained. Eastman et al. discloses in column 2, lines 47-50, "maintaining fatigue critical components in a system that maintains or increases the level of reliability or safety of the system while reducing the operating cost of the system for the system users."

13. As per claims 28 and 38, Harris et al. discloses prompting the user to select additional subsystems and components to analyze on page 2, paragraph 0013, "Operating data are collected from the targeted one or more machines or processes on an established schedule."

14. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harris et al. (USPN 20020091972A1) in view of McDonald et al. (USPN 6530065B1). Harris et al. fails to explicitly state a report generation component that compiles results produced from the simulation component.

McDonald et al. discloses this limitation in column 21, lines 41-43, "the system also provides report generation and marketing feedback information to device manufacturers or suppliers."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a report generation component that compiles results produced from the simulation component. A person of ordinary skill in the art would have been motivated to have a report generation component that compiles results

produced from the simulation component because the report allows others to view the results of the simulation.

Response to Arguments

15. Examiner would like to state that the previous action was incorrectly labeled as a Final Rejection. The previous action should have been a Second Non-Final Rejection. The current action being sent is a Final Rejection.

16. Applicant's arguments, see pages 2-5 of the Request for Reconsideration, filed August 20, 2004, with respect to the arguments concerning claim 1 not having simulation, on pages 2-3 of the request for reconsideration, claim 1 was previously given a new grounds of rejection in view of the arguments disclosed on page 3 of the previous request for reconsideration concerning the combining of Harris and Eastman that 'There is no need to use simulation in Harris to predict future failures because its predictive models perform this function. Therefore, Applicant submits that a person of ordinary skill in the art would not have a motivation to utilize the simulation functionality described in Eastman with the approach described in Harris, because Harris already uses the predictive models to predict future failures. There is no need to duplicate the same function with a different component.' Examiner agreed with Applicant's argument and the rejection of claim 1 had been changed from a 103 rejection to a 102 rejection. Examiner still stands on the argument that predictive models are used to predict future failures and performs the same function of performing simulation on the data to predict future failures.

17. Applicant discloses on page 2 arguments concerning the Examiner stating that 'service history logs can act as age information' as indicated in the previous action's arguments section. Examiner's arguments' concerning that statement still stands.

Applicant has failed to indicated what types of information can act as age information; therefore, Examiner believes it is proper for service history logs to be a type of age information since the servicing of the machine can include manufactures regular servicing as the machine ages to keep it functioning properly based on when certain components of the machine start to degrade in performance. This indicates the age of the machine.

Applicant also discloses on page in the request for reconsideration 'Applicant carefully reviewed this section noted by the Examiner and submits that Harris does not teach or provide a motivation suggesting the desirability of generating a statistical model based on age information... Furthermore, Harris' description of the analysis of historical operating data, which is found at least in paragraphs 0024 and 0035, does not disclose or suggest the desirability of generating a statistical model based on age information.'

Examiner respectfully disagrees with Applicant. The paragraph 0012 discloses 'Predictive models are then created based on the analysis of the first set of historical operating data'. Historical operating data includes service history logs as indicated in paragraph 0023 of the specification.

The claim 4 arguments disclosed on pages 4 and 5 are moot for the same reasons listed above.

Conclusion

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yolanda Wilson whose telephone number is (703) 305-3298. The examiner can normally be reached on M-F (7:30-4:00). I can be reached at a new number, (571) 272-3653, after October 15, 2004.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on (703) 305-9713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Robert Beausoliel
ROBERT BEAUSOLIEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100